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NASA Technical Memorandum 84615



Scientific and Technical Information  
Output of the Langley Research Center  
for Calendar Year 1982

JUNE 1983

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**NASA**



**NASA Technical Memorandum 84615**

**Scientific and Technical Information  
Output of the Langley Research Center  
for Calendar Year 1982**

*Compiled by*  
**Research Information and Applications Division**  
*Langley Research Center*  
*Hampton, Virginia*



National Aeronautics  
and Space Administration

**Scientific and Technical  
Information Branch**

1983

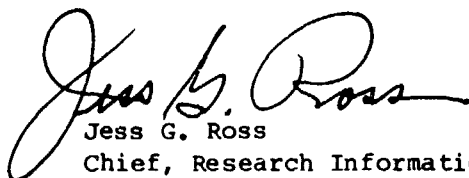
## FOREWORD

This report contains a listing of Langley Research Center's scientific and technical research output for calendar year 1982.

The intent of this report is to provide a greater awareness of the broad scope of results and the importance of the research and development work conducted by scientists and engineers at Langley. This current awareness is mandated by the National Aeronautics and Space Act of 1958, which provides for the widest practical dissemination of NASA research.

During the calendar year 1982, Langley's contributions to NASA and non-NASA literature included 130 NASA Formal Reports, 116 Quick-Release Technical Memorandums, 285 Contractor Reports, 188 Journal Articles and Periodical Literature, 590 Technical Talks and Meeting Presentations, 20 Computer Programs, 29 Tech Briefs, and 22 Patents.

Comments or suggestions concerning this publication should be addressed to the Research Information and Applications Division, Mail Stop 180A, NASA Langley Research Center, Hampton, Virginia 23665.

A handwritten signature in black ink, appearing to read "Jess G. Ross". The signature is fluid and cursive, with the first name "Jess" and last name "Ross" clearly distinguishable.

Jess G. Ross  
Chief, Research Information  
and Applications Division

## INTRODUCTION

The NASA Langley Research Center is one of the Nation's leading laboratories for research and development in the sciences of aeronautics and space technology. Langley conducts basic and applied research in fluid and flight mechanics, structures and materials, acoustics and noise reduction, measurement and instrumentation systems, numerical methods and techniques, data systems, electronics, physics, chemistry, and Earth and space sciences.

This publication is a compilation of Langley's scientific and technical research output for 1982 which is processed through the Center's Research Information and Applications Division, an integral part of NASA's Agency-wide Scientific and Technical Information (STI) system. This document is intended as a reference summary for researchers and as a current awareness publication for the scientific, research, and academic community.

The results of Langley's research are disseminated in a variety of NASA and non-NASA scientific and technical media and information systems. Details of the availability of the research references in this document are found in the section, "Availability," on page vii.

The citations are grouped first by Langley Directorates, then by the Langley Office or Division to which the senior author or innovator belongs. Citations are listed alphabetically by author or innovator under the following headings: Formal Reports (Technical Papers, Technical Memorandums, Conference Publications, Reference Publications, and Special Publications), Quick-Release Technical Memorandums, Contractor Reports, Journal Articles and Periodical Literature, Technical Talks and Meeting Presentations, Computer Programs, Tech Briefs, and Patents. There is a separate section listing NASA Contractor Reports funded by the Army Structures Laboratory, USARTL (AVRADCOM). If a citation has more than one author, it is listed only once under the first author's name. The subject category number used to index the citation and the Research Technology Objectives and Plans (RTOP) number are noted below citations when appropriate.

Computer Programs listed are those which were submitted by Langley to COSMIC in 1982. Those programs listed with an M accession number are available from COSMIC.

The NASA Tech Briefs cited have been released in 1982 for publication in "NASA Tech Briefs," a quarterly journal for United States industry and technology transfer agents. Subscriptions to this journal are available through the NASA Technology Utilization Program by writing to the Director, Technology Transfer Division, NASA Scientific and Technical Information, P. O. Box 8757, Baltimore/Washington International Airport, Maryland 21240.

Patents listed, which are owned in whole or in part by Langley Research Center personnel, have been published in issues of "Scientific and Technical Aerospace Reports" (STAR), a NASA announcement journal for report literature. A subscription to STAR is available from the U.S. Government Printing Office (GPO) or to qualified recipients from the NASA Scientific and Technical Information Facility (STIF).

## AVAILABILITY

<u>Category</u>	<u>Source</u>
Formal Reports Quick-Release Technical Memorandums Contractor Reports	National Technical Information Service (NTIS) 5285 Port Royal Road Springfield, VA 22161  NASA Scientific and Technical Information Facility (STIF) P. O. Box 8757 Baltimore/Washington International Airport, MD 21240  NASA Industrial Applications Centers (IAC) (See Appendix for addresses of IAC's)
Computer Programs (with M accession numbers)	Computer Software Management and Information Center (COSMIC) 112 Barrow Hall University of Georgia Athens, GA 30601
Langley Tech Briefs (also Technical Support Packages (TSP's))	Office of Technology Utilization and Applications Programs Mail Stop 139A NASA Langley Research Center Hampton, VA 23665
Patents:	
Patent Application Specifications	National Technical Information Service (NTIS)
Printed Copies	Commissioner of Patents and Trademarks U.S. Patent and Trademark Office Washington, DC 20231

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NASA LANGLEY RESEARCH CENTER  
Hampton, Virginia

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CALENDAR YEAR 1982

PUBLICATIONS FOR OFFICE OF THE DIRECTOR

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

1. Aiken, William S., Jr.; and Petersen, Richard H.: ACEE Program Rationale and Implementation. NASA TM-84549, August 1982, 34 p.  
(Avail: IAC Subject Category 01 RTOP 534-01-13)
2. Anon.: Langley Test Highlights - 1981. NASA TM-84519, July 1982, 55 p.  
(Avail: NTIS Subject Category 99)
3. Anon.: Research and Technology - 1982 Annual Report of the Langley Research Center. NASA TM-84570, November 1982, 90 p.  
(Avail: NTIS Subject Category 99)
4. Lee, Robert B., III; Gandrud, Bruce W.; Robbins, Donald E.; Rossi, Laurence C.; and Swann, Nigel R. W.: LIMBS Instrument Package (LIP) Balloon Experiment - Nimbus 7 Satellite Correlative Temperature, Ozone, Water Vapor, and Nitric Acid Measurements. NASA TM-83259, February 1982, 40 p.  
(Avail: NTIS Subject Category 45 RTOP 665-10-40)
5. Petersen, Richard H.; and Maddalon, Dal V.: NASA Research on Viscous Drag Reduction. NASA TM-84518, August 1982, 27 p.  
(Avail: NTIS Subject Category 02 RTOP 534-01-13)

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

#### Technical Talks and Meeting Presentations

6. Petersen, Richard H.; and Maddalon, Dal V.: NASA Research on Viscous Drag Reduction. Presented at the 13th ICAS Congress/AIAA Aircraft Systems and Technology Conference, August 22-27, 1982, Seattle, Washington.  
(Subject Category 02 RTOP 534-01-13)

#### Computer Programs

No computer programs.

#### Tech Briefs

No tech briefs.

#### Patents

No patents.



## PUBLICATIONS FOR OFFICE OF DIRECTOR FOR PROJECTS

### Formal Reports

7. Boyer, William J. (Compiler): Large Space Systems Technology - 1981, Part 1. NASA CP-2215, March 1982, 444 p.  
(Avail: NTIS Subject Category 15 RTOP 506-62-43)
8. Boyer, William J. (Compiler): Large Space Systems Technology - 1981, Part 2. NASA CP-2215, March 1982, 497 p.  
(Avail: NTIS Subject Category 15 RTOP 506-62-43)
9. Canady, John E., Jr.; and Allen, John L., Jr.: Illumination From Space With Orbiting Solar-Reflector Spacecraft. NASA TP-2065, September 1982, 88 p.  
(Avail: NTIS Subject Category 18 RTOP 506-62-43)

### Quick-Release Technical Memorandums

No quick-release technical memorandums.

### Contractor Reports

10. Hayes, D.: An Assessment of Alternate Thermal Protection Systems for the Space Shuttle Orbiter, Volume I - Executive Summary. (NAS1-16302 Rockwell International Corporation.) NASA CR-3548, April 1982, 70 p.  
(Avail: NTIS Subject Category 16 RTOP 936-34-00)

### Journal Articles and Periodical Literature

No journal articles and periodical literature.

### Technical Talks and Meeting Presentations

No technical talks and meeting presentations.

### Computer Programs

No computer programs.

### Tech Briefs

11. Schedule Analysis and Control Office: Project Planning and Reporting. NASA Tech Brief LAR-12919. Released 1982.  
(Category: Mathematics and Information Sciences)

PUBLICATIONS FOR AERONAUTICAL SYSTEMS OFFICE

Formal Reports

12. Baber, Hal T., Jr.: Characteristics of an Advanced Supersonic Technology Transport (AST-106-1) Configured With Variable-Cycle Engines for Transpacific Range. NASA TM-81879, March 1982, 95 p.  
(Avail: STIF Subject Category 05 RTOP 533-01-43)
13. Molloy, John K.; Grantham, William D.; and Neubauer, Milton J., Jr.: Noise and Economic Characteristics of an Advanced Blended Supersonic Transport Concept. NASA TP-2073, September 1982, 30 p.  
(Avail: NTIS Subject Category 01 RTOP 533-01-43)

Quick-Release Technical Memorandums

14. Corner, D. William: Characteristics of Future Aircraft Impacting Aircraft and Airport Compatibility. NASA TM-84476, May 1982, 26 p.  
(Avail: NTIS Subject Category 03 RTOP 530-03-13)
15. Graves, Ernel B.: The Feasibility of a High-Altitude Aircraft Platform With Consideration of Technological and Societal Constraints. NASA TM-84508, June 1982, 252 p.  
(Avail: NTIS Subject Category 05 RTOP 533-01-43)
16. Morris, Charles E. K., Jr.: A Flight Investigation of Blade-Section Aerodynamics for a Helicopter Main Rotor Having RC-SC2 Airfoil Section. NASA TM-83298, March 1982, 163 p.  
(Avail: NTIS Subject Category 02 RTOP 533-01-43)
17. Spearman, M. Leroy: Wind-Tunnel Studies of the Effects of Simulated Damage on the Aerodynamic Characteristics of Airplanes and Missiles. NASA TM-84588, December 1982, 23 p.  
(Avail: NTIS Subject Category 02 RTOP 505-43-43)

Contractor Reports

18. Ausrotas, Raymond A.: The U.S. Aviation System to the Year 2000. (NAS1-15268 Massachusetts Institute of Technology.) NASA CR-166010, July 1982, 121 p.  
(Avail: NTIS Subject Category 01 RTOP 530-04-13)
19. Carlson, Harry W.: Application of an Aerodynamic Analysis Method Including Attainable Thrust Estimates to Low Speed Leading-Edge Flap Design for Supersonic Cruise Vehicles. (NAS1-16000 Kentron International, Inc.) NASA CR-165843, March 1982, 28 p.  
(Avail: IAC Subject Category 01 RTOP 533-01-43)

20. Carlson, Harry W.; and Walkley, Kenneth B.: A Computer Program for Wing Subsonic Aerodynamic Performance Estimates Including Attainable Thrust and Vortex Lift Effects. (NAS1-16000 Kentron International, Inc.) NASA CR-3515, March 1982, 60 p.  
(Avail: NTIS Subject Category 01 RTOP 533-01-03)
21. DaCosta, R. A.; Lovell, W. A.; Martin, G. L.; Price, J. E.; and Turriziani, R. V.: Design and Analysis of a Small, Light-Weight RPV Test-Bed for Obtaining Airfoil Data at Low Reynolds Numbers. (NAS1-16000 Kentron International, Inc.) NASA CR-165978, September 1982, 40 p.  
(Avail: STIF Subject Category 05 RTOP 533-01-43)
22. Howison, W. W.; and Cronin, M. J.: Electronic/Electric Technology Benefits Study. (NAS1-16199 Lockheed-California Company.) NASA CR-165890, May 1982, 226 p.  
(Avail: NTIS Subject Category 04 RTOP 530-04-13)
23. Jacobson, Ira D.; and Kuhlthau, A. Robert: Identification of Terms to Define Unconstrained Air Transportation Demands. (NAS1-14908 University of Virginia.) NASA CR-165961, April 1982, 61 p.  
(Avail: NTIS Subject Category 03 RTOP 530-04-13)
24. McQuilkin, F. T.: Feasibility of SPF/DB Titanium Sandwich for LFC Wings. (NAS1-16236 Rockwell International Corporation.) NASA CR-165929, June 1982, 63 p.  
(Avail: NTIS Subject Category 01 RTOP 534-01-13)
25. Page, G. S.; Cunningham, E. J.; and Welge, H. R.: Supersonic Aerodynamic Wind Tunnel Test Results of an Advanced 2.2 Mach Cruise Transport Configuration. (NAS1-14624 McDonnell Douglas Corporation.) NASA CR-165933, March 1982, 150 p.  
(Avail: STIF Subject Category 01 RTOP 505-43-53)
26. Spencer, Frank A.: A Reappraisal of Transport Aircraft Needs 1985-2000: Perceptions of Airline Management in a Changing Economic, Regulatory, and Technological Environment. (NAG1-180 Northwestern University.) NASA CR-165887, March 1982, 178 p.  
(Avail: NTIS Subject Category 03 RTOP 530-01-13)
27. Staff of Boeing Commercial Airplane Company: Large Payload Capacity SST Concepts - Technical and Economic Feasibility. (NAS1-16150 Boeing Commercial Airplane Company.) NASA CR-165934, July 1982, 222 p.  
(Avail: STIF Subject Category 01 RTOP 533-01-43)
28. Sussman, M. B.; Upton, G.; Sevigny, E.; Petit, J. E.; Schreffler, E. S.; Stoecklin, R. E.; and Goetz, G. F.: Study of Potential for Sustained Supersonic Cruise Military Aircraft Utilizing Advanced Technologies - Volume I. (NAS1-16701 Boeing Military Airplane Company.) NASA CR-165957, May 1982, 374 p.  
(Avail: STIF Subject Category 05 RTOP 533-01-43)

29. Yetter, Jeffrey A.; and Evelyn, George B.: Nozzle Installation Effects for Supersonic Cruise Configurations. (NAS1-16150 Boeing Commercial Airplane Company.) NASA CR-165835, June 1982, 177 p.  
(Avail: STiF                      Subject Category 05                      RTOP 533-01-43)

#### Journal Articles and Periodical Literature

30. Maddalon, D. V.: Air Transportation. McGraw-Hill Encyclopedia of Science and Technology, 5th Edition, April 1982, p. 237-242.  
(Subject Category 03                      RTOP 534-01-13)
31. Maglieri, D. J.; and Dollyhigh, S. M.: We Have Just Begun to Create Efficient Transport Aircraft. Astronautics and Aeronautics, Volume 20, February 1982, p. 26-38.  
(Subject Category 05                      RTOP 501-43-43)

#### Technical Talks and Meeting Presentations

32. Driver, Cornelius: Long Endurance Airplane Study, Status Review. Presented at the Defense Science Board, May 28, 1982, Washington, DC.  
(Subject Category 02                      RTOP 505-43-43)
33. Heyson, Harry H.: Long Endurance Airplane Study, Summary. Presented at the Defense Science Board, July 21, 1982, Washington, DC.  
(Subject Category 02                      RTOP 505-43-43)
34. Heyson, Harry H.: Operational Implications of Some NACA/NASA Rotary Wing Induced Velocity. Presented at the Illinois DOT and FAA 5th Annual Midwest Helicopter Flight Safety Seminar, October 5-7, 1982, Glenview, Illinois.  
(Subject Category 02                      RTOP 533-01-43)
35. Heyson, Harry H.: Long Endurance Airplane Parametric Study. Presented at the Defense Science Board Task Force on Long Endurance Airplanes, December 1982, Washington, DC.  
(Subject Category 02                      RTOP 505-43-43)
36. Spearman, M. Leroy: U.S./U.S.S.R. Military Aircraft Trends. Presented at the 1982 Annual Meeting of the Virginia Academy of Science, April 20-23, 1982, Blacksburg, Virginia.  
(Subject Category 01                      RTOP 505-43-33)
37. Williams, Louis J.: Advanced Technology for Future Regional Transport Aircraft. Presented at the 1982 SAE Commuter Aircraft and Airline Operations Meeting, May 24-26, 1982, Savannah, Georgia.  
(Subject Category 01                      RTOP 530-01-13)
38. Williams, Louis J.: Future Commuter Aircraft--The Potential for Unconventional Designs. Presented at the 13th ICAS Congress and AIAA Aircraft Systems and Technology Conference, August 22-27, 1982, Seattle, Washington.  
(Subject Category 01                      RTOP 530-01-13)

39. Williams, Louis J.; and Maglieri, Domenic J.: 1981 Workshop Results: Airport and Aircraft Compatibility Problems and Solution 1981-2010. Presented at the NRC Commission on Sociotechnical Systems 61st Annual Meeting of the Transportation Research Board - Session on "Aspects and Impacts of Aircraft and Airport Compatibility," January 18-22, 1982, Washington, D.C.  
(Subject Category 03 RTOP 530-04-13)
40. Witcofski, Robert D.: Experimental and Analytical Analyses of the Mechanisms Governing the Dispersion of Flammable Clouds Formed by Liquid Hydrogen Spills. Presented at the Atlantic Richfield Foundation/International Association for Hydrogen Energy World Hydrogen Energy Conference IV, June 13-17, 1982, Pasadena, California.  
(Subject Category 28 RTOP 505-31-07)

#### Computer Programs

41. Carlson, Harry W.; and Walkley, Kenneth B. (Kentron International, Inc.): SUBAER--Wing Subsonic Aerodynamic Performance Estimates Including Attainable Thrust and Vortex Lift Effects. Program No. LAR-12987. NASA Accession No. M82-10496. Released 1982.  
(Subject Category 02)
42. Foss, Willard E., Jr.: A Computer Program for Detailed Analysis of the Takeoff and Landing Performance Capabilities of Transport Category Aircraft. Program No. LAR-13086. Submitted 1982.  
(Subject Category 02)

#### Tech Briefs

No tech briefs.

#### Patents

No patents.

## PUBLICATIONS FOR SCOUT PROJECT OFFICE

### Formal Reports

No formal reports.

### Quick-Release Technical Memorandums

No quick-release technical memorandums.

### Contractor Reports

43. Clayton, F. I.; Dirling, R. B.; Eitman, D. A.; and Loomis, W. C.: Integral Throat Entrance Development, Qualification and Production for the Antares III Nozzle. (NAS1-15650 Science Applications, Inc.) NASA CR-165838, January 1982, 229 p.  
(Avail: NTIS                      Subject Category 15                      RTOP 490-02-02)
44. Knauber, R. N.: Computer Program for Prediction of Capture Maneuver Probability for an On-Off Reaction Controlled Upper Stage. (NAS1-15000 Vought Corporation.) NASA CR-165937, May 1982, 99 p.  
(Avail: IAC                      Subject Category 61                      RTOP 490-02-02)
45. Knauber, R. N.: Computer Program for Post-Flight Evaluation of a Launch Vehicle Upper-Stage On-Off Reaction Control System. (NAS1-15000 Vought Corporation.) NASA CR-166029, November 1982, 78 p.  
(Avail: IAC                      Subject Category 61                      RTOP 490-02-02)
46. Knauber, R. N.: Computer Program for Prediction of Fuel Consumption Statistical Data for an Upper-Stage Three-Axis Stabilized On-Off Control System. (NAS1-15000 Vought Corporation.) NASA CR-166031, November 1982, 129 p.  
(Avail: IAC                      Subject Category 61                      RTOP 490-02-02)
47. Knauber, R. N.: Computer Program for Post-Flight Evaluation of the Control System Response for an Attitude Controlled Missile. (NAS1-15000 Vought Corporation.) NASA CR-166032, November 1982, 69 p.  
(Avail: IAC                      Subject Category 61                      RTOP 490-02-02)
48. Knauber, R. N.: Computer Program for Post-Flight Analysis of Rigid Body Moments Acting on a Launch Vehicle First Stage. (NAS1-15000 Vought Corporation.) NASA CR-166033, November 1982, 177 p.  
(Avail: IAC                      Subject Category 61                      RTOP 490-02-02)
49. Leiss, Abraham: Scout Launch Vehicle Program Final Report - Phase VI. (NAS1-16520 Williamsburg West, Inc.) NASA CR-165950, Part 1, May 1982, 552 p.  
(Avail: STIF                      Subject Category 15)

50. Leiss, Abraham: Scout Launch Vehicle Program Final Report - Phase VI.  
(NAS1-16520 Williamsburg West, Inc.) NASA CR-165950, Part 2, May 1982,  
380 p.  
(Avail: STIF                      Subject Category 15)
51. Leiss, Abraham: Scout Launch Vehicle Program Final Report - Phase VI.  
(NAS1-16520 Williamsburg West, Inc.) NASA CR-165950, Part 3, May 1982,  
316 p.  
(Avail: STIF                      Subject Category 15)
52. Myler, T. R.: Scout Trajectory Error Propagation Computer Program. (NAS1-  
15000 Vought Corporation.) NASA CR-166030, November 1982, 78 p.  
(Avail: IAC                      Subject Category 61                      RTOP 490-02-02)

#### Journal Articles and Periodical Literature

No journal articles and periodical literature.

#### Technical Talks and Meeting Presentations

No technical talks and meeting presentations.

#### Computer Programs

53. Myler, T. R. (Vought Corporation): Near Earth Mission Analysis Routine  
Plotting Computer Program: NEMAP. Program No. LAR-13025. Submitted 1982.  
(Subject Category 15)
54. Myler, T. R. (Vought Corporation): Elliptical Orbit Performance Computer  
Program: ELOPE. Program No. LAR-13026. Submitted 1982.  
(Subject Category 15)
55. Myler, T. R. (Vought Corporation): MIED--Moments of Inclination Error  
Distribution Computer Program. Program No. LAR-13027. NASA Accession No.  
M82-10501. Released 1982.  
(Subject Category 15)

#### Tech Briefs

No tech briefs.

#### Patents

No patents.

PUBLICATIONS FOR LONG DURATION EXPOSURE FACILITY PROJECT OFFICE

Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

56. Price, P. B.: Definition Study for an Advanced Cosmic Ray Experiment Utilizing the Long Duration Exposure Facility. (NAS1-16268 The Regents of the University of California.) NASA CR-165918, June 1982, 56 p.  
(Avail: NTIS                      Subject Category 93                      RTOP 538-46-01)

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Technical Talks and Meeting Presentations

57. Kinard, William H.: The LDEF Benefits. Presented at the Canaveral Council of Technical Societies 19th Space Conference, Making Space Work for Mankind, April 28-30, 1982, Cocoa Beach, Florida.  
(Subject Category 15                      RTOP 542-04-13)
58. Kinard, William H.; and Jones, James L., Jr.: The Long Duration Exposure Facility--Research Opportunities in the 1980's. Presented at the Lunar and Planetary Institute 13th Lunar and Planetary Science Conference, March 15-17, 1982, Houston, Texas.  
(Subject Category 34                      RTOP 542-04-13)

Computer Programs

No computer programs.

Tech Briefs

No tech briefs.

Patents

No patents.



PUBLICATIONS FOR AIRCRAFT ENERGY EFFICIENCY PROJECT OFFICE

Formal Reports

59. ACEE Composites Project Office: Standard Tests for Toughened Resin Composites. NASA RP-1092, May 1982, 27 p.  
(Avail: NTIS Subject Category 24 RTOP 534-03-13)
60. Maddalon, Dal V. (Editor): Laminar Flow Control - 1981 Research and Technology Studies. NASA CP-2218, March 1982, 143 p.  
(Avail: NTIS Subject Category 02 RTOP 534-01-13)
61. Tuttle, Marie H.; and Maddalon, Dal V.: Laminar Flow Control (1976-1982) - A Selected, Annotated Bibliography. NASA TM-84496, August 1982, 81 p.  
(Avail: NTIS Subject Category 34 RTOP 534-01-13)

Quick-Release Technical Memorandums

62. Leonard, Robert W.: Fuel Efficiency Through New Airframe Technology. NASA TM-84549, August 1982, 155 p.  
(Avail: IAC Subject Category 01 RTOP 534-01-13)

Contractor Reports

63. Allen, John B.; Oliver, Wayne R.; and Spacht, Lee A.: Wind Tunnel Tests of High-Lift Systems for Advanced Transports Using High-Aspect Ratio Supercritical Wings. (NAS1-15327 McDonnell Douglas Corporation.) NASA CR-3523, July 1982, 188 p.  
(Avail: IAC Subject Category 02 RTOP 534-02-13)
64. Alva, T.; et al.: Advanced Manufacturing Development of a Composite Empennage Component for L1011 Aircraft - Phase IV Final Report - Manufacturing Development. (NAS1-14000 Lockheed-California Company.) NASA CR-165885, May 1982, 75 p.  
(Avail: IAC Subject Category 24 RTOP 534-03-13)
65. Aniversario, R. B.; Harvey, S. T.; McCarty, J. E.; Parsons, J. T.; Peterson, D. C.; Pritchett, L. D.; Wilson, D. R.; and Wogulis, E. R.: Design, Ancillary Testing, Analysis, and Fabrication Data for the Advanced Composite Stabilizer for Boeing 737 Aircraft, Volume II - Final Report. (NAS1-15025 Boeing Commercial Airplane Company.) NASA CR-166011, December 1982, 412 p.  
(Avail: IAC Subject Category 24 RTOP 534-03-13)
66. Aniversario, R. B.; Harvey, S. T.; McCarty, J. E.; Parsons, J. T.; Peterson, D. C.; Pritchett, L. D.; Wilson, D. R.; and Wogulis, E. R.: Full-Scale Testing, Production, and Cost Analysis Data for the Advanced Composite Stabilizer for Boeing 737 Aircraft, Volume II - Final Report. (NAS1-15025 Boeing Commercial Airplane Company.) NASA CR-166012, December 1982, 108 p.  
(Avail: IAC Subject Category 24 RTOP 534-03-13)

67. Griffin, C. F.; and Dunning, E. G.: Development of an Advanced Composite Aileron for the L-1011 Transport Aircraft. (NAS1-15069 Lockheed-California Company.) NASA CR-3517, February 1982, 41 p.  
(Avail: IAC                      Subject Category 24                      RTOP 534-03-13)
  
68. Guinn, Wiley A.: Development and Flight Evaluation of an Augmented Stability Active Controls Concept - Executive Summary. (NAS1-15326 Lockheed-California Company.) NASA CR-166009, November 1982, 22 p.  
(Avail: IAC                      Subject Category 08                      RTOP 534-02-13)
  
69. Guinn, W. A.; et al.: Development and Flight Evaluation of an Augmented Stability Active Controls Concept. (NAS1-15326 Lockheed-California Company.) NASA CR-165951, September 1982, 183 p.  
(Avail: IAC                      Subject Category 08                      RTOP 534-02-13)
  
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No computer programs.

#### Tech Briefs

No tech briefs.

#### Patents

No patents.

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Formal Reports

No formal reports.

Quick-Release Technical Memorandums

No quick-release technical memorandums.

Contractor Reports

No contractor reports.

Journal Articles and Periodical Literature

No journal articles and periodical literature.

Technical Talks and Meeting Presentations

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Tech Briefs

No tech briefs.

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No patents.



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No patents.

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No journal articles and periodical literature.

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No patents.

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## APPENDIX

### INDUSTRIAL APPLICATIONS CENTERS

Aerospace Research Applications Center  
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1201 East 38th Street  
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Indianapolis, IN 46223  
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Durant, OK 74701  
(405) 924-6822

NASA Industrial Applications Center  
710 LIS Building  
University of Pittsburgh  
Pittsburgh, PA 15260  
(412) 624-5211

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Research Annex, Room 200  
3716 South Hope Street  
Los Angeles, CA 90007  
(213) 743-6132

New England Research Applications Center  
Mansfield Professional Park  
Storrs, CT 06268  
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North Carolina Science and Technology Research Center  
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(919) 549-0671

Technology Applications Center  
University of New Mexico  
2500 Central Avenue, SE  
Albuquerque, NM 87131  
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NASA/Florida State Technology Applications Center  
State University System of Florida  
500 Weil Hall  
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